

Amendments To The Specification:

Please amend the paragraph beginning at line 5 of page 5 to read as follows:

Referring now to the drawings and especially to FIG. 1, more specifically a movable barrier door operator, or garage door operator is generally shown therein and referred to by numeral 10 includes a head unit 12 mounted within a garage 14. A barrier moving activating receiver 80 includes a routine for responding to rolling access codes. The access code routine, when used with other routines and apparatus of the system, is capable of properly learning and responding to received access codes. An access code learning device of the receiver 80 enables an access code learning mode of operation. When the access code learning mode is entered and a rolling access code is first received and learned, the rolling access routine is executed to control the opener and to learn new rolling access codes. More specifically, the head unit 12 is mounted to the ceiling 16 of the garage 14 and includes a rail 18 extending therefrom with a releasable trolley 20 attached having an arm 22 extending to a multiple paneled garage door 24 positioned for movement along a pair of door rails 26 and 28. The system includes a hand-held transmitter unit 30 adapted to send signals to an antenna 32 positioned on the head unit 12 and coupled to the receiver 80 as will appear hereinafter, and a learning transmitter 31. In this description the transmitter 30, which is the transmitter already known to the operator, is called the original transmitter, and the transmitter 31 is called the learning transmitter. An external control pad 34 is positioned on the outside of the garage having a plurality of buttons thereon and communicate via radio frequency transmission with an antenna

Reply to Office Action of July 14, 2004

32 of the head unit 12. A switch module 39 is mounted on a wall of the garage. The switch module 39 is connected to the head unit 12 by a pair of wires 39Aa. The switch module 39 includes a light switch 39Bb, a lock switch 39Cc and a command switch 39Dd. An optical emitter 42 is connected via a power and signal line 44 to the head unit 12. An optical detector 46 is connected via a wire 48 to the head unit 12.

Please amend the paragraph beginning at line 15 of page 8 to read as follows:

Referring now to FIGS. 8A-8B, the flow chart set forth therein describes the operation of the original transmitter 30. A rolling code from non-volatile memory is incremented by three in step 500, followed by the rolling code being stored (step 502) for the next transmission from the transmitter when a transmitter button is pushed. The order of the binary digits in the rolling code is inverted or mirrored in a step 504, following which in a step 506, the most significant digit is converted to zero effectively truncating the binary rolling code. The rolling code is then changed to a trinary code having values 0, 1 and 2 and the initial trinary rolling code is set to 0. It may be appreciated that it is trinary code, which is actually used to modify the radio frequency oscillator signal and the trinary code is best seen in FIG. 7. It may be noted that the bit timing in FIG. 7 for a 0 is 1.5 milliseconds down time and 0.5 millisecond up time, for a 1, 1 millisecond down and 1 millisecond up and for a 2, 0.5 millisecond down and 1.5 milliseconds up. The up time is actually the active time when carrier is being generated. The down time is inactive when the carrier is cut off. The codes are

assembled in two frames, each of 20 trinary bits, with the first frame being identified by a 0.5 millisecond sync bit and the second frame being identified by a 1.5 millisecond sync bit.

Please amend the paragraph beginning at line 31 of page 8 to read as follows:

In a step 510, the next highest power of 3 is subtracted from the rolling code and a test is made in a step 512 to determine if the result is equal to zero. If it is, the next most significant digit of the binary rolling code is incremented in a step 514, following which flow is returned to the step 510. If the result is not greater than 0, the next highest power of 3 is added to the rolling code in the step 516. In the step 518, another highest power of 3 is incremented and in a step 520, a test is determined as to whether the rolling code is completed. If it is not, control is transferred back to step 510. If it has, control is transferred to step 522 to clear the bit counter. In a step 524, the blank timer is tested to determine whether it is active or not. If it is not, a test is made in a step 526 to determine whether the blank time has expired. If the blank time has not expired, control is transferred to a step 528 in which the bit counter is incremented, following which control is transferred back to the decision step 524. If the blank time has expired as measured in decision step 526, the blank timer is stopped in a step 530 and the bit counter is incremented in a step 532. The bit counter is then tested for odd or even in a step 534. If the bit counter is not even, control is transferred to a step 536 where the bit of the fixed code bit counter divided by 2 is output. If the bit counter is even, the rolling code bit counter divided by 2 is

output in a step 538. By the operation of 534, 536 and 538, the rolling code bits and fixed code bits are alternately transmitted. The bit counter is tested to determine whether it is set to equal to 80 in a step 540. If it is, the blank timer is started in a step 542. If it is not, the bit counter is tested for whether it is equal to 40 in a step 544. If it is, the blank timer is tested and is started in a step 543 ~~544~~. If the bit counter is not equal to 40, control is transferred back to step 522.

Please amend the paragraph beginning at line 19 of page 9 to read as follows:

The receiver 80 is shown in detail in FIG. 5. RF signals may be received by the controller 70 at the antenna 32 and fed to the receiver 80. The receiver 80 includes a pair of inductors 170 and 172 and a pair of capacitors 174 and 176 that provide impedance matching between the antenna 32 and other portions of the receiver. An NPN transistor 178 is connected in common base configuration as a buffer amplifier. The RF output signal is supplied on a line 220 ~~200~~, coupled between the collector of the transistor 178 and a coupling capacitor 222 ~~220~~. The buffered radio frequency signal is fed via the coupling capacitor 222 to a tuned circuit 224 comprising a variable inductor 226 connected in parallel with a capacitor 228. Signals from the tuned circuit 224 are fed on a line 230 to a coupling capacitor 232 which is connected to an NPN transistor 234 at its base. The collector 240 of transistor 234 is connected to a feedback capacitor 246 and a feedback resistor 248. The emitter is also coupled to the feedback capacitor 246 and to a capacitor 250. A choke inductor 256 provides ground potential to a pair of

Reply to Office Action of July 14, 2004

resistors 258 and 260 as well as a capacitor 262. The resistor 258 is connected to the base of the transistor 234. The resistor 260 is connected via an inductor 264 to the emitter of the transistor 234. The output signal from the transistor is fed outward on a line 212 to an electrolytic capacitor 270.

Please amend the paragraph beginning at line 24 of page 10 to read as follows:

The microcontroller 85 responds to signals received from the wall switch 39, the transmitter 30, the up and down limit switches, the obstruction detector and the RPM signal to control the motor 106 and the light 81 by means of the light and motor control relays 104. The on or off state of light 81 is controlled by a relay 105b, which is energized by pin P01 of microcontroller 85 and a driver transistor 105A~~a~~. The motor 106 up windings are energized by a relay 107B~~b~~ which responds to pin P00 of microcontroller 85 via driver transistor 107A~~a~~ and the down windings are energized by relay 109B~~b~~ which responds to pin P02 of microcontroller 85 via a driver transistor 109A~~a~~.

Please amend the paragraph beginning at line 30 of page 10 to read as follows:

Each of the pins P00, P01 and P02 is associated with a memory mapped bit, such as a flip/flop, which can be written and read. The light can thus be turned on by writing a logical "1" in the bit associated with pin P01 which will drive transistor 105A~~a~~ on energizing relay 105B~~b~~, causing the lights to light via the contacts of relay 105B~~b~~ connecting a hot AC input 135 to the

light output 136. The status of the light 81 can be determined by reading the bit associated with pin P01. Similar actions with regard to pins P00 and P02 are used to control the up and down rotation of motor 106.